▶ Core Competence

▶ Rcore Software Platform

Products

DA-682

x86-based rackmount embedded computer

- Software selectable RS-232/422/485 with 2 KV isolation protection
- PCI expansion slots for inserting expansion modules
- Built-in industrial-grade DOM, CF/SATA interface for storage expansion
- Built-in DDR2 SDRAM and industrial flash disk module

V2101-T

x86-based Intel Atom 1.1 GHz embedded computer

- Intel Atom Z510PT 1.1 GHz processor
- Dual independent displays (VGA + LVDS)
- 2 RS-232/422/485 serial ports, 2 Gigabit Ethernet ports, 4 USB 2.0 hosts, 3 DIs, 3 DOs
- -40 to 85°C wide temperature models for harsh environments

V2401

x86-based Intel Atom 1.6 GHz embedded computer

- Rugged high-grade Intel Atom N270 x86 processor
- Dual independent displays (VGA, DVI, LVDS selectable)
- DDR2 SODIMM socket, supporting DDR2 533 up to 2 GB (max.)
- 4 RS-232/422/485 and 8 RS-232 serial ports; 4+4 DI/DO channels

V2406

x86-based Intel Atom 1.6 GHz embedded computer

- Rugged high-grade Intel Atom N270 x86 processor
- Dual independent displays (VGA + DVI)
- 4 serial ports, 6 DIs + 2 DOs, 4 USB 2.0 ports
- 2 10/100 Mbps Ethernet ports with M12 connector

V2426

x86-based Intel Atom 1.6 GHz embedded computer

- Dual Independent displays (VGA + DVI-I)
- 4 serial ports, 6 DIs + 2 DOs, 3 USB 2.0 ports (Type A x 2, M12 x 1)
- 2 10/100 Mbps Ethernet ports with M12 connector
- Modular design support: WiFi/3.5G/GPS module, Mini PCIe adaptor (for adding a cellular module)

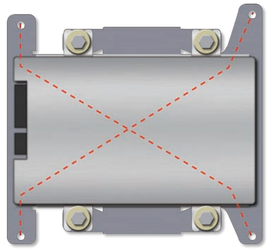
MC-4610 -C23

x86-based Core 2 Duo industrial computer

- Dual 10/100/1000 Mbps Ethernet ports with screw on RJ45 connectors and M23 power connector
- 3 USB 2.0 ports (Type A x 2, M12 x 1), 8 DI channels, 2 serial ports
- Dual independent displays (VGA + DVI)
- 3 SATA-150 connectors for hard drive disk expansion

Spotlight

Innovative Anti-vibration and Anti-shock Technology for Hard Disks (Patent Pending)



After rethinking the approach to hard disk anti-vibration protection, Moxa came up with an innovative method that takes into consideration the specific physical characteristics of hard disks. The new technology involves placing a bracket around the hard disk to absorb vibrations and maintain balance, so that the hard disk is not affected by excessive vibration and shocks.

By using an asymmetrical design, the bracket filters out most natural frequencies and effectively reduces vibrations. Moxa's industrial computers use this breakthrough technology to overcome the heavy vibration and shocks of industrial applications, such as those experienced on trains and vehicles. With this new bracket, Moxa's embedded computers can easily pass EN50155 certification.

EN50155 Certified

EN50155 certification specifies standards for the operation, design, construction, and testing of electronic equipment used on rail vehicles and in railway applications. Moxa's railway series computers are EN50155 certified and undergo environmental testing to ensure reliable performance under a variety of power supply conditions, such as voltage variations, power interruptions, and supply changeover. The computers can also withstand environmental disturbances, including vibration, shock, and temperature variations.

Rcore Software Platform

Moxa's Rcore ready-to-run platform makes it easy for programmers to develop embedded software. Rcore includes easy-to-use application libraries, tested bug-free sample code, and requires less time for the concept validation and development cycle to enable a faster time-to-mark that meets or exceeds customer requirements. The Rcore Community also offers our partners easy access to software and technical knowledge about embedded systems, along with an interactive forum to share knowledge with embedded computing professionals. Visit http://rcorecommunity.moxa.com/ for details.

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P/N: 1900031001180

Transportation Automation ▶ Industrial Computing

Complete Industrial Embedded Computing Solutions for Railway Applications

- Variety of modules for greater versatility
- Anti-vibration M12 connections
- EN50155 certification
- Dual independent displays (VGA + DVI-I)

Embedded Computing from Ticket Booth to Track

Moxa's embedded computer products have been used in a number of railway automation applications around the world. The embedded computer plays an important role in railway automation by acting as a front-end computer, data acquisition workhorse, or even serving as the central controller and management computer for an entire system. The diagram shown below provides an overview of how embedded computers are typically used throughout a train station, from the train itself to other components such as the control center, turnstile, and ticketing system.

Moxa's embedded computers are well-suited for rollling stock applications. The computers offer powerful computing functions that can perform complicated industrial tasks, and they are easily integrated with a variety of peripheral devices. In addition, the computers can be used as central control units for passenger information systems and network video recording. The computers come with versatile interface connections built in, and with their powerful computing capability, they are an optimal and cost-effective solution for rolling stock applications.

A typical rolling stock application requires powerful and reliable embedded computers to connect to various remote devices. Moxa's embedded computers are ideal control units that are designed to meet all the requirements of rolling stock applications—powerful computing performance, various peripheral interfaces, and a ready-to-run platform—to ensure a reliable and stable solution that is simple to deploy.

▶ Ticketing System

1 Ticketing System

One of the most important components of a ticket vending machine is the bank confirmation process that checks the customer's bank ID and account status and processes debits for ticket purchases from an ATM or credit card. An embedded computer located on-site can communicate directly with local devices. Moxa's V2101-T x86-based Intel Atom 1.1 GHz embedded computer has the perfect set of features for use in this application. With two LAN ports for network redundancy, one LAN port can connect to the banking ID approval system, while the other LAN port links with the IPC. In addition, the V2101-T offers both VGA and LVDS displays, which make it perfect for industrial digital signage applications since both the customer and the maintenance staff can use a separate display. This means that even as engineers maintain the system using the second display, customers can continue to use the machine on the primary display. It is also equipped with two serial ports and four USB 2.0 ports to manage peripheral devices such as a card reader, receipt printer, and keyboard for customer inputs.

Why Moxa?

- Dual LAN ports for simultaneous connections to IPC and ID approval system
- Small, rugged design is ideal for installation in tight spaces
- Data filtering frees up bandwidth and contributes to better data management
- Provides tighter security and improved response time in emergencies
- VGA and LVDS dual independent display technology
- Connect various devices and convert from serial to Ethernet
- Audio/video technologies

▶ Turnstile System

2 Turnstile System

The embedded computer for the turnstile system also serves as the central controller and management computer. When visitors pass through the turnstile, the embedded computer receives signals from a sensor and magnetic card reader immediately, and then causes the gate to open and display a message on the turnstile panel. Moxa's V2401 embedded computer is ideal for this type of application since it features dual independent displays (VGA, DVI, LVDS selectable) and 2 LAN ports for network redundancy. In addition, the multiple serial ports connect the gateway's sensor, magnetic card reader, and panel. A real-time control and management system is a must for this type of application.

Why Moxa?

- Fanless, cableless, no hard drive, and low power consumption design offers a more reliable solution
- Flexible, ready-to-run platform that provides multiple interfaces and greater stability for easy integration with third-party devices
- The V2401 supports DI/DO, serial, and Ethernet interfaces for easy integration and better communication
- Small size with DIN-Rail and wall mounting options
- Optical isolation to minimize risks

▶ Railway Station System Integration

3 Railway Station System Integration

A railway line is composed of several stations that communicate by sending data to local devices, a remote management center, and/or third parties. The main issue faced when creating a railway station monitoring system is integrating and communicating between different, remote systems. Moxa's DA-662 embedded computer is ideal as a front-end processor for collecting data from peripheral systems, including transportation information systems, public-address systems, access control systems, passenger gates, closed circuit televisions, platform screen doors, automated fare collection systems, environmental monitoring control systems, building automation systems, and fire alarm systems to form an integrated and manageable communication system. With such an integrated system, local devices, remote management centers, and other stations can access and share data easily and in real-time.

Why Moxa?

- The low power consumption and fanless design reduces management and maintenance costs
- The DA-682 features 4 LAN ports for real-time communication and sharing data between local sites, control centers, and third parties
- The DA-682 features modular flexibility for greater versatility
- Only 10 seconds required for system restart
- Virus-free Linux platform

▶ Rolling Stock

4 Rolling Stock Application

5 6 As the main part of a railway system, rolling stock presents some unique hardware design and protocol integration challenges, and requires a steady, reliable, and consistent platform. Major subsystems include monitoring of key components such as speed control, the brake safety system, mileage counter, door and window control, vehicle route monitoring, and power electronics response.

Rolling stock applications include three major systems, each of which should be automatically monitored by the control center: Mobility Control Unit, Passenger Information System, and Network Video Recorder.

Mobility Control Unit: This system includes a display panel to allow the conductor to monitor vehicle status. A powerful computing platform is used to connect various devices, such as analog/digital I/O units, GPS modules, audio devices, and wireless modules. Fast hand-over times from access point to access point enable immediate status updates to better control the railway system and keep passengers well-informed in all phases of the journey, while still accommodating the mobile nature of ground-to-train communications.

Passenger Information System: This system needs a powerful computing unit to quickly show information on the connected display. An industrial switch is also used for communications with the Ethernet network, and the system can be further expanded with passenger entertainment features.

Network Video Recorder: A reliable network video recording system is responsible for performing efficient and real-time video monitoring. With an industrial-grade PoE switch, it is easier to install VoIP phones and IP cameras on the platform when a power supply is not readily available. The nodes at the front and rear of the train need a higher level of performance in order to support NVR playback, but entry-level embedded computers with built-in storage expansion is enough to record video in the individual train carriages.

Why Moxa?

- Industrial-grade certifications to meet industrial standards, such as EN50155 and e Mark
- Wide temperature models for operations in extremely harsh environments
- Many interfaces for versatile device connectivity—serial ports, Ethernet ports, switch ports, digital input/output channels, CANbus ports, USB hosts, CF/SD sockets, hard disk drive support, and M12 connectors for robust and reliable connections
- Wide range of power input options to satisfy the specific power requirements of different field sites
- Flexible and modular design for easy future expansion
- Various installation options including DIN-Rail, wallmount, and rackmount for optimal space utilization